

to the shells above referred to. The form of the columella is a valid reason for the removal of the species from the family *Purpuridæ*; and as in well-preserved adult specimens, a very short sinus exists, the species should have a place in that of *Pleurotomidæ*. In the absence of the notch on the outer lip, the well-defined flexure of the striæ of growth is alone sufficient to justify its transference from the one family to the other. The position of the sinus and other external features permit its reception in the genus *Mangelia*, and it should, henceforth, be known as *M. anomala*. Indeed its affinity to *M. Vincentina*, Crosse, is sufficiently close to necessitate close comparison to separate extreme forms of each from one another.

South Australian examples are for the most part of an opaque white, with black blotches, between the costæ, at the anterior suture and on the middle line of the last whorl; but a few, with thinner tests, exhibit the more elaborate markings which belong to the type specimen.

M. anomala is a rare shell in South Australian waters, though I have gathered it, from among shell sand, at widely separated localities, thus:—Aldinga Bay and Salt Creek, east and west sides of St. Vincent's Gulf, respectively; Wauraltie, east side of Spencer's Gulf; and Fowler's Bay, Great Australian Bight.

DESCRIPTIONS OF AUSTRALIAN MICRO-LEPIDOPTERA.

BY E. MEYRICK, B.A.

III. TINEINA.

In the following paper I have described forty-seven species of the least-developed families of the *Tineina*; five of these have been previously described, the remaining forty-two are new to science. One only out of the whole (*Bedellia somnulentella*, Z.) occurs elsewhere, being common to Europe and North America,

though it is now difficult to say whether it has or has not been introduced by man into this and other countries: the rest are all endemic.

The families here treated of form (with the addition of the genus *Nepticula*, of which I am acquainted with at least fifteen Australian species, though not yet prepared to describe them,) a natural group, sharply terminated at both ends, though admitting of a wide range of structural variation. The materials collected are sufficient to give a fairly accurate conception of the form in which the group appears in this region, and enable me to make a few remarks upon the classification and order of development of the genera. Excluding *Nepticula*, these are generally classed in three families,—*Gracilaridæ*, *Lithocolletidæ*, and *Lyonetidæ*. Wocke has wished to split up the *Lyonetidæ* into two or more families, on the ground of differences in neururation, but this seems very unnecessary. I am clear, however, that *Lithocolletis* and its allies cannot be kept apart from the *Gracilaridæ*, with which they agree in the structure of the head, and especially in respect of the fourteen-legged larva, found in no other *Tineina*, and of the larval habits. There are however a few very small genera (*Tischeria*, *Bedellia*, *Urodeta*, *Arctocoma* (described hereafter), and perhaps *Oenophila*, of which the larva is hardly known) which are sometimes referred to the *Lithocolletidæ*, and sometimes to the *Elachistidæ* but do not agree with either, being separated from the former by the sixteen-legged larvæ, and from the latter by the roughly tufted head. I would place these in a separate family, which I have below called *Bedellidæ*, a step which appears to me to be in accordance with nature, and to simplify the systematic discrimination of the families. The *Lyonetidæ* form a natural group, distinguished from both the preceding by the basal joint of the antennæ expanded into an eyecap. The *Nepticulidæ* also possess the eyecap, but have well-developed maxillary palpi, peculiar neururation, and larvæ with 18 imperfectly developed pro-legs, not found elsewhere in the *Tineina*.

For rightly understanding the process of development a careful comparison of the fauna of other regions is required, and the *Micro-Lepidoptera* have been as yet very partially studied. It is possible, however, to make a fair comparison with the region which Mr. Wallace has called Palaearctic, so far as it is represented by Europe, and with North and South America to a less extent; and to make use of a few fragments of positive evidence from other countries, with the following results. I should premise that these minute *Micro-Lepidoptera*, from their extreme delicacy, fragility, and defencelessness, from their lacking the rapid and powerful means of locomotion of butterflies and large moths, and from the usually very short term of their lives, afford excellent material for the study of geographical distribution.

The well-marked generic differences of structure, and the fixity of type in most cases, are very conspicuous in these lowest families and are evidences of a hoary antiquity. In no genus is this more evident than in *Nepticula*, which is represented apparently all over the world in equal proportion, by numerous species which have everywhere an extreme resemblance to one another. Of the other genera in these families *Bucculatrix*, *Opostega*, *Phyllocnistis*, *Coriscium*, and *Gracilaria*, appear to have also a practically world-wide range. Of some of the other genera, which have but few species, it is not yet safe to say where they may not be found. There is however one extensive genus which is interesting by its entire absence from the Australian region, namely *Lithocolletis*, of which I could not have failed to find traces if it had existed here. (I may observe here, that the insect described by Newman as *Lithocolletis lalagella*, (Trans. Ent. Soc., Lond., Vol. III., N. S., 300) is certainly a *Gracilaria* allied to *G. caenotheta* and *autadelpha*, but not accurately identifiable. This genus comprises a very large number of species in Europe, and North and South America, and is also known to occur in India; most forest trees have one or more species attached to them, and of many the individuals in extreme profusion, showing that throughout this range of

climate they are a dominant race. No reason can be assigned why the genus should not occur in Australia, except that it must have come into existence since the time when Australia was last in immediate communication by land with the continent, when it obtained its original supply of *Mammalia*, which is believed to carry us back to somewhere near the close of the Secondary period. Now *Gracilaria*, which is more highly organised, and would be generally regarded as a development of *Lithocolletis*, is found evenly distributed over the whole world, as stated above. It appears to me to follow from this that *Lithocolletis* came into existence much later than *Gracilaria*; and that if, as from their close alliance seems almost certain, one was developed from the other, it was *Lithocolletis* which is a degraded development of *Gracilaria*. It would appear also that the same is true of *Ornix*; whose cone-rolling larvæ should be noticed in connection with the cone-rolling larvæ of the higher *Gracilaria* in Europe and North America, as it is very probable that the habit is of late development. *Coriscium*, though possessing few species, is apparently contemporaneous with *Gracilaria*. The rest of the family consists at present of three small North American genera, of which I am only able to say that they are allied to *Lithocolletis*. The ancestral form of the family may therefore be regarded as a form corresponding very nearly to the smaller species of *Gracilaria*.

Turning now to the *Bedellidæ*, we find them to be a very small group, yet having distinct affinities with the *Gracilaridæ*, the *Lyonetidæ*, and though *Elachista* with the *Elachistidæ*. They may probably be the last surviving representatives of a once wider family. As in their case there is at present but little available material, I will not force conclusions; but it seems likely that we may have here the nearest existing approach to the original organisms from which the above-mentioned three families took their rise. The commonly swollen basal joint of the antennæ points to the source of the eyecap in the *Lyonetidæ*; and the

attitude of the imago in *Bedellia* (preserved also in *Tischeria*) is a rudiment of the peculiar position assumed by a *Gracilaria*.

The *Lyonetidæ*, though a very natural family, have a very wide range of structure in respect of the head and the neururation. *Stegommata* and *Lyonetia* are very nearly allied, and might well be considered sections of one genus. Regarding them so, then *Bucculatrix*, *Crobylophora*, and *Stegommata* would form a natural group in the family, distinguished by the roughly tufted head. *Opostega* and *Cemiostoma* are also naturally associated, and *Phyllocnistis* appears by its quite smooth head and apodal larva to be an extreme development of these. *Atalopsycha* may perhaps be intermediate between the two groups, but it could not yet be safely affirmed. Most of these genera, though small, are of universal range, and the others are known as yet merely as small local developments, so that nothing can yet be predicted from the facts of their geographical distribution. I am disposed to think, however, that *Bucculatrix*, which is the largest of them, and also the most persistent in type, is probably the oldest, and nearest to the original form. It is also the nearest to the *Nepticulidæ*, which we are probably justified in regarding for the present as a very ancient but degenerate development of *Bucculatrix*, or rather of the progenitors of *Bucculatrix*.

In the preceding remarks I have been twice led to assert that a more lowly organised form has been derived from a higher, and I have reason to believe, as in subsequent communications I hope to show, that this has taken place more commonly than is often supposed. Such examples are not, however, as a superficial observer might suppose, a violation of the law of improvement under natural selection. According to the principle of evolution any change may occur if beneficial, and the degradation, and consequent simplification, of an organism must often be as great a benefit, as its complication at the cost of increased requirements. It will, I think, be in practice rarely found that the lowest

organised species or genus of a group is the nearest to the immediate ancestor of the whole group.

Subjoined is an analytical table of the genera hereafter referred to, which may be an assistance to their ready identification.

A.—basal joint of antennæ not forming an eyecap.

a.—head with appressed scales.

1. second joint of palpi smooth or rarely
loosely scaled beneath *Gracilaria*
2. second joint of palpi with a projecting
tuft *Coriscium*

b.—head shortly rough-haired ; antennæ longer
than forewings *Epicephala*

c.—head roughly tufted above.

1. antennæ as long as fore-wings ; hind-
wings linear *Bedellia*
2. antennæ shorter than fore-wings ; hind-
wings lanceolate *Arctocoma*

B.—basal joint of antennæ dilated into an eyecap.

a.—head roughly tufted above.

1. antennæ longer than fore-wings .. *Stegommata*
2. antennæ shorter than fore-wings.
* labial palpi developed *Crobylophora*
** no labial palpi *Bucculatrix*

b.—head roughly short-haired in front, smooth
behind *Opostega*

c.—head with appressed scales ; hind-wings
lanceolate *Atalopsycha*

d.—head smooth, glossy ; hind-wings nearly
setiform *Phyllocnistis*

GRACILARIDÆ.

GRACILARIA, Z.

Head smooth ; no ocelli ; tongue long. Antennæ as long or longer than fore-wings, slender, filiform. Maxillary palpi rather

long, filiform. Labial palpi moderately long, ascending, arched, slender, cylindrical; second joint smooth, sometimes loosely scaled beneath, terminal joint nearly as long as second. Fore-wings elongate, very narrow, parallel-sided, costa bent at apex or evenly pointed. Hind-wings very narrowly lanceolate, much narrower than fore-wings, cilia thrice or four times as broad. Abdomen elongate, slender. Legs long, slender; middle tibiæ often much thickened with scales. Fore-wings with 12 or 11 veins, 5 branches to costa, no secondary cell, 1 simple. Hind-wings with from 8 to 6 veins, 3 and 5 being sometimes obsolete; 5 and 6 stalked, cell open.

This genus is of world-wide occurrence, about seventy species being hitherto known. All the species are elegant and some of great beauty; when at rest they sit with the forepart much raised and the two anterior pairs of legs, which are often elegantly marked, conspicuously displayed. They are somewhat retired in habit, and may often be easiest found at rest on fences.

The larvæ are fourteen-legged, slender, always mining in leaves when young; afterwards many of the European and American species construct hollow cones for habitations, by rolling up pieces of the leaves they feed on; others remain miners all their life. All the Australian species, with the larvæ of which I am acquainted are miners throughout life, nor have I ever seen indications of the familiar cones of this genus in Australia. The mining larvæ usually leave the mine in order to form their cocoon.

The genus is well-marked and easy of recognition, but some slight variations of structure are found within its limits, principally in respect of the scaling of the middle pair of tibiæ, and the second joint of labial palpi: the gradations are however so insensible, that they do not admit of breaking up the genus by their means. The twenty-nine species here described may be tabulated as follows:

A.—middle tibiæ very much thickened throughout with scales.

- a.*—fore-wings dark purple-fusca . . 1. *cœnopella*
b.—fore-wings reddish-ochreous
 1. with a double yellow costal triangle 2. *xanthopharella*
 2. with costa broadly yellow . . 3. *adelina*
c.—fore-wings pale ochreous, costa broadly
 white 4. *auchetidella*

B.—middle tibiæ slightly (often unevenly) or not thickened.

- a.*—fore-wings yellow with central crimson streak 15. *ethela*
b.—fore-wings crimson with yellow or white markings.
 1. head pale yellow; 6 costal streaks 16. *formosa*
 2. head white; 7 costal streaks . . 17. *ida*
c.—fore-wings metallic coppery-green or bronze.
 1. with two white spots 14. *chalcoptera*
 2. with 4 costal and 4 dorsal streaks 22. *eumetalla*
d.—fore-wings unicolorous dark slaty-grey 5. *æthalota*
e.—fore-wings white with fuscous or ochreous markings.
 1. inner margin brownish-ochreous . 18. *mnesicala*
 2. inner margin white.
 * antennæ wholly white . . 20. *ællomacha*
 ** antennæ annulated with dark
 fuscous 19. *lyginella*
f.—forewings ochreous with grey markings 6. *plagata*
g.—fore-wings ochreous or grey with white markings.
 1. with straight transverse fasciæ and marginal spots.
 * fasciæ spotted with black . . 8. *ordinatella*
 ** fasciæ not spotted, alternating
 with black transverse clouds 7. *lepidella*

*** fasciæ not spotted, without
black clouds.

† with one fascia and four spots 12. *hoplocala*

†† with one fascia and five spots . . 13. *calicella*

††† with two or three fasciæ.

‡ thorax greyish-ochreous . . 9. *tricuneatella*

‡‡ thorax white.

§ third fascia represented by two
opposite nearly equal spots . . 11. *cænotheta*

§§ third fascia entire, or if inter-
rupted, lower spot much the
larger 10. *autadelpha*

2. with a longitudinal, inner-marginal
streak and marginal spot.

* with five costal streaks . . 24. *alysidota*

** with two costal streaks.

† head and inner-marginal streak
ochreous 25. *ochrocephala*

†† head and inner-marginal streak
brassy-white 26. *nerëis*

††† head and inner-marginal streak
pure white.

‡ streak along inner-margin itself 27. *didymella*

‡‡ streak separated from inner-
margin by a streak of ground
colour 28. *laciniella*

3. with both margins irregularly white 29. *albomarginata*

4. with marginal spots only.

* fore-wings golden-ochreous,
clouded with dark bronze . . 23. *eupetala*

** fore-wings pale clear greyish-
ochreous 21. *thalassias*

Grac. cœnopella, n. sp.

♀ . 4". Head and thorax very dark fuscous ; maxillary palpi whitish, apex of joints fuscous ; labial palpi dark fuscous, internally ochreous-whitish. Antennæ longer than fore-wings, dark fuscous. Abdomen dull ochreous-grey. Legs ochreous-whitish, tarsal joints fuscous at apex ; anterior tibiæ dark fuscous above ; middle tibiæ very much thickened, dark purplish-fuscous. Fore-wings very dark purple-fuscous ; a faint whitish fascia from before middle of costa, rather oblique outwardly ; a few pale scales at apex ; cilia dark grey, blackish round apex of wing. Hind-wings and cilia dark grey.

One specimen bred in May from larvæ found commonly in the Botanical Gardens, Sydney ; the food-plant is native to Australia, but appears to grow north of Sydney.

Larva pale yellowish, feeding in a flat irregular blotch, originating in a slender gallery, beneath upper surface of leaves of *Tetranthera ferruginea*, (*Laurineæ*) in April. Pupa in a white cocoon beneath the turned down corner of a leaf.

Grac. xanthopharella, n. sp.

♂ ♀ . 5"-5½". Head above and thorax ochreous-reddish tinged with purple, face and maxillary palpi pale yellow. Labial palpi pale yellow, extreme apex dark fuscous. Antennæ longer than fore-wings, ochreous-reddish above, yellowish beneath, with darker annulations. Abdomen pale ochreous, suffused above posteriorly with fuscous-grey. Legs pale ochreous-yellow ; anterior and middle tibiæ dark purplish-red fuscous, middle tibiæ much thickened ; posterior tarsi with the two apical joints very narrowly dark fuscous at base. Fore-wings reddish-violet, partially tinged with ochreous ; a small, very oblique, rather oval, pale yellow spot near base, its lower end reaching the fold ; a large pale yellow costal triangle, rather before middle, its apex almost reaching inner margin, its upper angle produced along costa as a semioval patch, reaching nearly to apex ; a few yellow scales at

anal angle ; cilia fuscous-violet round apex, containing a reddish-yellow patch below apex, and with three indistinct blackish lines, thence fuscous-grey. Hind-wings and cilia fuscous-grey.

Scarce ; occurs at Sydney and Parramatta from November to February, flying in the sun. Allied to the group of *alchimiella*, Sc., and apparently nearest to the North American *superbifrontella* Clem., but not to be mistaken.

Grac. adelina, n. sp.

♂ ♀. 6". Head and thorax ochreous-reddish with violet reflections, face snow-white. Maxillary palpi whitish, externally ochreous-reddish. Labial palpi reddish-ochreous, white at base, lower half of terminal joint externally purple-fuscous. Antennæ longer than fore-wings, pale reddish-ochreous, annulated with dark fuscous. Abdomen fuscous-grey, pale ochreous at base, beneath metallic-yellow. Legs pale ochreous ; anterior tibiæ blackish ; middle tibiæ very much thickened, deep reddish suffused with violet black. Fore-wings deep reddish-ochreous with violet reflections, with a very broad, pale metallic-yellow costal band, covering more than half the breadth of wing, and extending almost from base to apex ; the ground colour sends a conical projection into this band before middle, cutting half through it, and midway between this and base is a much shorter, obtuse projection, both suffused with deep cobalt-blue ; the lower $\frac{2}{3}$ of the reddish-ochreous inner-marginal portion is marked from base to apex with regular, transverse strigulæ of brilliant deep cobalt-blue, appearing black in some lights ; cilia reddish-ochreous round apex, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

This magnificent species is unsurpassed in the elegance and intensity of its colouring. I took one pair in dense swampy forest in January, near Hamilton, on the Waikato, New Zealand. It seem to be nearly allied to the North American *violacella*, Clem., and *blandella*, Clem.

Grac. auchetidella, n. sp.

♀. $4\frac{1}{2}$ "-5". Head and thorax whitish-ochreous mixed with grey. Maxillary palpi white. Labial palpi white, apex of second joint and a broad ring before apex of terminal joint black. Antennæ whitish-ochreous, annulated with black. Abdomen pale greyish-ochreous. Legs pale ochreous, joints of tarsi very narrowly black at base; anterior tibiae black; middle tibiae very much thickened with black scales. Fore-wings with costal half whitish, dorsal half and hind-margin pale ochreous, irrorated sparsely throughout with blackish scales, and densely along a longitudinal dilating streak from base to apex; these scales tend to form regular transverse strigulae on costal and dorsal margins; on the white costal half is a broad central pale ochreous transverse perpendicular fascia, densely irrorated with black; cilia fuscous-grey, with three indistinct black lines round apex. Hind-wings fuscous-grey, cilia paler, tinged with ochreous at base.

Allied to the preceding, but very different. Two specimens beaten in October from the dense subtropical forest near the top of the Bulli Pass, Illawarra, 1,500 feet above the sea.

Grac. æthalota, n. sp.

♂. $4\frac{1}{4}$ ". Head glossy dark grey, face paler. Labial palpi whitish, apex of second joint and a subapical ring of terminal joint black. Antennæ longer than fore-wings, grey-whitish, with evanescent fuscous annulations. Thorax and abdomen dark fuscous-grey. Legs whitish, tarsal joints suffused with pale fuscous except an apical ring, anterior and middle tibiae not thickened, suffused with fuscous above. Fore-wings unicolorous dark glossy slaty grey, with one or two pale scales at apex; cilia dark fuscous, with three obscure blackish lines round apex, and a whitish hook. Hind-wings and cilia dark fuscous-grey.

Not apparently nearly allied to any described species; superficially it seems to belong to the preceding group, but differs in

the middle tibiæ being quite slender. One specimen beaten from forest near Dunedin, New Zealand, in January.

Grac. plagata, Stt., Trans. Ent. Soc., Lond., Vol. I., 3rd Ser.

“5½”. Head greyish-ochreous. Maxillary palpi white, spotted with dark fuscous. Labial palpi white, base of second joint and two spots on terminal joint dark fuscous. Antennæ pale fuscous, with darker annulations, basal joint pale ochreous-grey in front, dark fuscous behind. Thorax greyish-ochreous. Legs white, tarsi spotted with dark fuscous, anterior and middle tibiæ dark brown. Fore-wings greyish-ochreous, faintly olive, with an oblique darker fascia beyond middle, followed by a large irregular blue-black blotch; before the apical black spot is a slender whitish fascia, perpendicularly placed; basal portion of wing rather irregularly marbled with darker, the first defined marking being the oblique fascia, which is anteriorly edged with blackish, and broadest on inner margin; the blotch beyond this begins on the disc, sharply edged with black; it then extends to the costa on which it is of considerable breadth, enclosing a small costal spot of the pale ground-colour; it slopes gradually towards inner margin, reaching it just at anal angle, its outer edge pretty well defined with black scales and followed immediately by a slightly oblique fascia of the pale ground-colour towards the costa but much suffused towards inner margin; this is followed by a fuscous patch nearly of the colour of the central fascia, intersected by an oblique, black streak, beyond which is the slender, perpendicularly placed, dark-margined white fascia; a minute, black apical spot; cilia olive-brown, paler towards tips, intersected by two blackish lines, on inner-margin dark grey. Hind-wings dark grey, cilia grey.”

The above is Stainton's original description, accompanied by a figure, and taken from a single specimen, said to be from the neighbourhood of Brisbane. The species appears to be somewhat allied to *syringella*, F., and intermediate between the two main

divisions of the genus ; I have not met with any specimens coming at all near the description, so that it is probably a subtropical species.

Grac. lepidella, n. sp.

♂. $3\frac{1}{4}''$ - $4\frac{1}{4}''$. Head and thorax whitish-ochreous or white mixed with fuscous. Maxillary palpi whitish-ochreous, second joint black. Labial palpi whitish-ochreous, second joint and a median ring of terminal joint blackish. Antennæ slightly longer than fore-wings, whitish-ochreous, annulated with dark fuscous. Abdomen whitish-ochreous. Legs whitish, anterior and middle tibiæ somewhat thickened, blackish ; tarsal joints with black apical rings, broadest on basal joint, basal joint of posterior tarsi also with broad black median ring. Fore-wings brownish-ochreous, clouded with black, and with two fasciæ and four spots white, confusedly black-margined ; first spot on inner margin near base, large, irregular, meeting a blackish cloud on costa ; first fascia at $\frac{1}{4}$, second in middle, both rather narrow, straight, perpendicular ; intermediate between them is a transverse fascia-like blackish cloud, and another similar one beyond second fascia, distinct and clearly margined posteriorly, meeting the very small second spot on anal angle ; third spot on costa beyond $\frac{3}{4}$, small, wedge-shaped, broadly margined posteriorly by a black subapical fascia from costa to hind-margin ; fourth apical, somewhat fascia-like, extending into cilia above apex ; cilia pale fuscous-grey, with four irregular black lines round apex. Hind-wings and cilia fuscous-grey.

Not closely allied to any known species. Two specimens taken on a fence near Sydney, in September and January.

Grac. ordinatella, n. sp.

♀. $4''$. Head and thorax ochreous-white. Maxillary palpi whitish, terminal joint fuscous. Labial palpi whitish, a broad apical ring on second joint, a median and an apical ring of

terminal joint dark fuscous. Antennæ ochreous-white, becoming obscurely dark fuscous at apex. Abdomen above fuscous-grey, beneath white with black rings. Legs white; anterior and middle tibiæ somewhat thickened, base narrowly and apex broadly black, tarsi with two black rings; posterior tibiæ stiff-haired above, with median and apical black bands. tarsi with bases of joints narrowly and centres of first and second joints broadly black-banded. Fore-wings greyish-ochreous, irrorated with blackish, along costa suffused with blackish, with three fasciæ and two spots, white spotted with black and edged with black scales; first fascia at $\frac{1}{4}$, perpendicular, broader on inner margin and suffusedly produced on inner margin towards base, containing costal, discal, and dorsal black spots; the basally produced portion projects across disc close to base, between which and the fascia is a white dot below costa; second fascia from costa slightly before middle, outwardly oblique, evenly broad, irregularly margined, containing large subcostal and discal black spots, and a few black scales on inner margin; third fascia from costa slightly before $\frac{3}{4}$, parallel to second, narrower, and partially interrupted on disc, containing large subcostal black spot; a small irregular partially black-centred costal spot at $\frac{5}{8}$; a rather large apical spot, containing a few black scales; cilia dark fuscous-grey, with a blackish line round apex. Hind-wings dark fuscous, cilia fuscous-grey.

Somewhat allied to the preceding, but distinguished from all by the black spots in the white fasciæ; *quadrifasciata*, Stt., from India (bred from *Urena lobata*) seems from the figure to be an allied species. One specimen on a fence near Sydney in June.

Grac. tricuneatella, *n. sp.*

♂ ♀ . 4". Head and palpi snow-white, apex of maxillary palpi dark fuscous; labial palpi with apex of second joint and a sub-apical ring of terminal joint dark fuscous. Antennæ longer than fore-wings, dark fuscous with faintly paler annulations, basal joint white. Thorax greyish-ochreous. Abdomen dark fuscous,

beneath whitish. Legs white; anterior tibiæ black with white basal and median bands, middle tibiæ slightly thickened, black with white median band, posterior tibiæ with narrow basal and broad median black bands, all tarsi with four black bands. Forewings moderately dark greyish-ochreous, with three sometimes confluent wedge-shaped fasciæ and two spots snow-white, black margined; first and second fasciæ very narrow on costa, rapidly dilating, very broad on fold, narrower on inner margin, second more oblique; third oblique, formed by union of very small costal spot and very large dorsal triangle; these three are sometimes confluent along fold; a small costal spot before apex, produced as an oblique narrow streak to hind-margin; a small apical spot, extending into cilia; cilia round apex whitish, with two partial black lines, thence pale grey. Hindwings and cilia fuscous-grey.

Distinguished from the allied species by the greyish-ochreous thorax and strongly dilated fasciæ. The imago is retired in habits; taken sparingly in April on the creek at Parramatta amongst its foodplant, and also bred.

Larva tapering posteriorly throughout, segments deeply incised; dull yellowish, tinged with greenish-grey, each segment with an irregular, oblong transverse, blackish-green dorsal spot; head black, with a pale line on each side meeting behind; anal segment very small, blackish. Feeds in irregular flat whitish blotches beneath upper surface of leaves of *Typha latifolia* (*Typhaceæ*), in March. Pupa inside the mine in an oval flattened cocoon.

Grac. autadelpha, n. sp.

♂ ♀. $3\frac{1}{4}$ "- $3\frac{3}{4}$ ". Head, thorax, and palpi snow-white, terminal joint of labial palpi with slender black basal and subapical rings. Antennæ longer than forewings, dark fuscous, whitish at base, basal joint white with black apex. Abdomen dark fuscous, anus white, beneath white with slender black rings posteriorly. Anterior tibiæ blackish, with indistinct basal and median whitish rings, tarsi white with two dark fuscous bands; middle tibiæ somewhat

thickened, blackish with broad white median band, tarsi white with two dark fuscous bands; posterior tibiæ dark fuscous with narrow basal and broad median white bands, tarsi white with four dark fuscous bands. Fore-wings deep ochreous-grey, with three straight fasciæ and two spots snow-white, black margined; base narrowly white; first fascia very broad, almost as broad on costa as on inner margin, outer edge irregular; second fascia less broad, not oblique, irregular-margined, rather broadest on inner margin; third oblique, very broad on inner margin, very narrow on costa, strongly contracted below costa, rarely interrupted, but if so, costal spot minute, dorsal very large; a small costal spot before apex, indistinctly obliquely produced to hind-margin, sometimes obscured with black scales; an ovate apical spot, extending into cilia; cilia whitish round apex, with a black line, thence fuscous-grey. Hind-wings fuscous-grey, cilia paler.

Differs from *tricuneatella*, especially by the white thorax; very closely allied to the succeeding *cænotheta*, easiest distinguished by the white basal joint of antennæ and different shape of fasciæ. Frequents dry scrub; the larva is no doubt attached to one of the *Proteaceæ*, probably to a *Banksia*; the food plant of *cænotheta* does not grow where this species has been taken. Scarce; in the bush near Sydney, in February and March.

Grac. *cænotheta*, *n. sp.*

♂ ♀. $3\frac{1}{2}$ "-4". Head and palpi snow-white, terminal joint of labial palpi with slender, black, basal and sub-apical rings. Antennæ longer than fore-wings, grey-whitish towards base, becoming bark fuscous towards apex, basal joint black. Thorax white, anterior margin narrowly black. Abdomen blackish, anus white, beneath with white rings. Anterior tibiæ black, with indistinct basal and median whitish rings, tarsi white with two black bands; middle tibiæ somewhat thickened, black with broad median white band, tarsi white with two black bands; posterior tibiæ black with narrow basal and broad median white bands,

tarsi white with four black bands. Fore-wings deep ochreous-grey, with two strait fasciæ and four spots snow-white, black margined; base narrowly white; first fascia broad, dilating from costa to inner margin, outer edge irregular; second much narrower broadest on inner-margin, slightly oblique outwardly; a small costal spot at $\frac{3}{4}$ and a rather larger one somewhat beyond it on inner margin, nearly meeting; a smaller costal spot immediately before apex, produced by black scales obliquely to hind-margin; a rather large ovate apical spot, extending into cilia; cilia greyish-ochreous beneath apex, with a black line, thence fuscous-grey. Hind-wings fuscous-grey, cilia paler.

Very close to the preceding species, but the basal joint of antennæ is black above, and the third fascia is always represented by two not very unequal opposite spots. The Indian *terminaliæ*, Stt., belongs to this group, but the third fascia is represented by a costal spot only; it was bred from *Terminalia catappa*. The imago of *cænothetæ* is retired in habits, and I have only once taken it; I bred several from the larvæ, which are not uncommon; I have only found the species at Blackheath on the summit of the Blue Mountains, 3,500 feet above the sea.

Larva yellowish, (undescribed); feeds in a large irregular whitish blotch in upper surface of leaves of *Telopea speciosissima* (*Proteaceæ*), the well-known "Waratah"; the mine is at first flat but later the upper epidermis contracts and causes the formation of a hollow chamber, somewhat similar to the mines of the genus *Lithocolletis*, but much larger in proportion. Pupa in an ochreous cocoon, outside the mine.

Grac. hoplocala, *n. sp.*

♂ ♀. $3\frac{3}{4}$ "-4". Head and palpi snow-white, apex of second joint of labial palpi faintly grey. Antennæ dark fuscous with faint paler annulations, basal joint white. Thorax white, lateral margins golden-brown. Abdomen fuscous-grey, beneath white with dark bands. Legs white, anterior tibiæ blackish with a

white spot, middle tibiæ slightly thickened with black median and apical bands, posterior tibiæ stiff-haired with blackish apical and subapical bands, all tarsi with five black rings. Fore-wings rather pale golden-brown, with a fascia and four spots snow-white black-margined; first spot on inner margin almost at base, black-margined externally only, fascia-like, rather oblique, not reaching costa, indistinct above; fascia before $\frac{1}{3}$, somewhat oblique inwardly, narrow on costa, gently dilated to fold, where it is much less broad than in *calicella*, thence parallel-sided; second spot on costa before $\frac{2}{3}$, very small; third very large, acute-triangular, on inner margin at anal angle, its apex only separated from second spot by the black margins; fourth forming an oblique subapical streak from costa to middle of hind margin; cilia fuscous-grey, with two black streaks radiating from apex at an obtuse angle, the lower produced backwards into white costal cilia. Hind-wings and cilia fuscous-grey.

Allied to the three preceding species, but with only one complete fascia; very nearly allied to the following *calicella*, Stt., but immediately known by the absence of one of the costal spots, as well as the narrower fascia. Taken rather freely on a fence in Sydney in October, during windy weather; the larva is probably attached to some species of *Eucalyptus*.

Grac. *calicella*, Stt., Trans. Ent. Soc. Lond., Vol. I., 3rd Ser.

♂ ♀. $3\frac{3}{4}$ "- $4\frac{1}{4}$ ". Head and palpi snow-white, apex of second joint of labial palpi faintly grey. Antennæ dark fuscous, faintly annulated with paler, towards base whitish. Thorax snow-white lateral margins ochreous-brown. Abdomen fuscous-grey, beneath white with narrow dark bands. Legs whitish, anterior and middle tibiæ slightly thickened, with black median and apical bands, posterior tibiæ stiff-haired, all tarsi with five black rings. Fore-wings rather pale golden brown, with a fascia and five spots snow-white, black margined (except first); first spot on inner margin almost at base, not blackmargined, fascia-like, very oblique, not

reaching costa, above indistinct; fascia before $\frac{1}{3}$, very narrow on costa, very rapidly dilated and extremely broad on fold, where its outer edge is angulated inwards to inner margin; second spot on middle of costa, small, outwardly oblique; third on costa beyond it, much slenderer, rather less oblique; fourth broadly triangular on inner margin at anal angle, united to third by a small black cloud; fifth forming an oblique subapical streak from costa to middle of hind-margin; cilia fuscous-grey, with two black streaks radiating from apex at an obtuse angle, the lower produced backwards into white costal cilia. Hind-wings and cilia fuscous-grey.

Closely allied to the preceding species, but recognisable by the additional spot in middle of costa, and the more strongly dilated fascia. I have little doubt that my specimens are really Stainton's species; the only point of difference in his description is that he represents the first spot on inner margin as being extended to costa, which may be a slight error or an individual variety, as the description was taken from one specimen only, sent from Brisbane; moreover he gives the size as only 3", and the fascia in his figure appears to be less broad; however it seems best to adopt his name. I have only once taken the imago; I have bred it sparingly from larvæ found in the dry bush round Sydney and Parramatta. in July and October.

Larva yellowish, tapering posteriorly; feeds in a broad, flat, irregular blotch in upper surface of leaves of *Eucalyptus*, *sp.*, in September. Pupa in a flat cocoon within the mine. In the case of this and other *Eucalyptus*-feeding insects it is commonly very difficult or impracticable to discover the specific name of the *Eucalyptus* to which they are attached; the determination of this genus is always difficult, and the larvæ are generally found to occur on young plants which have not yet flowered.

Grac. chalcoptera, *n. sp.*

♀. 4". Head, thorax, and palpi bright metallic coppery bronze. Antennæ dark fuscous with indistinct paler rings, basal joint

bronze. Abdomen very dark purplish-fuscous. Legs coppery-bronze, tarsi bronzy-fuscous, paler towards base of joints, middle tibiæ hardly thickened. Fore-wings bright metallic coppery-bronze, with two small yellowish-white spots; first on inner-margin beyond middle, narrow, curved, parallel-sided, not reaching middle of disc; second on costa before apex, wedge-shaped, outwardly curved, reaching half across wing; cilia dark fuscous, with indistinct blackish lines round apex. Hind-wings dark fuscous, cilia rather paler.

A brilliant insect, somewhat allied to the group of *auroguttella*, Stph. One specimen taken in March with a lamp amongst the reedbeds in the creek at Parramatta.

Grac. ethela, *n. sp.*

♂ ♀. $5\frac{1}{2}$ "- $5\frac{3}{4}$ ". Head yellow on crown, crimson behind, face snow-white with a pale crimson-pink spot on each side. Maxillary palpi white, lower $\frac{2}{3}$ externally pale crimson. Labial palpi white, second joint externally crimson, beneath fringed with a few loose hairs. Antennæ much longer than fore-wings, pale greyish-ochreous, basal joint yellow. Thorax yellow, anterior margin broadly crimson, and with a small crimson spot behind. Abdomen pale greyish-ochreous. Legs yellowish-white, tarsi with very slender blackish rings at apex of joints, anterior and middle tibiæ slightly thickened, crimson-fuscous at apex and with two slender dark fuscous rings. Fore-wings pale yellow, deeper along inner margin, with a bright crimson irregular-edged undulating central streak from base to apex, connected with inner margin by four perpendicular half-fasciæ, one close to base, the others at $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$, and expanding abruptly at apex into a large apical spot; at the base this streak reaches costa, and at $\frac{1}{2}$ from base is again connected with it by a perpendicular spot; beyond this on costa are two small crimson strigulæ; central streak in parts margined above with black; parallel to its upper edge, and immediately above it, is a waved, black, longitudinal line, extending from

midway between third and fourth inner-marginal spot to midway between fourth and apical spot ; apical spot pure crimson, containing a circular black spot above centre, above which the colour becomes brownish-ochreous and is margined on costa with black ; lower half of apical spot filled up with a sharp wedge-shaped snow-white spot, the base of which is yellow and separated from the rest by a crimson line : cilia yellow round apex, containing a blackish hook, crimson below apical spot, thence pale crimson-grey. Hind-wings dull pale purple-crimson, costal cilia grey, rest suffused with pale crimson.

Var. *a*.—all the crimson markings replaced by dull fuscous.

This exceedingly beautiful insect cannot be compared with any other, but is probably most allied to *formosa* and *ida*. The loosely haired second joint of the palpi render it peculiar in the genus, but the hairs do not form a tuft, and it cannot therefore be referred to *Coriscium*, to which it is not otherwise specially related ; probably Stainton is correct in stating his opinion that a knowledge of the exotic species of *Gracilaria* will tend to widen the definition of the generic structure in respect of the scaling of the labial palpi, in which allied species deviate. I took seven very perfect specimens (six typical, one of the variety) amidst dense growth in the swampy virgin forest near Hamilton, on the Waikato, New Zealand, in January, mostly under tree-ferns. New Zealand insects are usually rather sombre ; and I shall not easily forget the emotion with which, in the depths of the forest shades, I saw this lovely insect, whose ethereally pure hues cause it to be one of the most wonderful manifestations of the beauty of nature.

Grac. formosa, *Stt.*, Trans. Ent. Soc. Lond., Vol. I., 3rd Ser.

♂ ♀ . $4\frac{1}{2}$ "-5". Head pale yellow, with a central stripe on crown and the sides crimson ; face white with a few crimson scales. Maxillary palpi white, faintly crimson-tinged. Labial palpi white, second joint externally faintly suffused with crimson and with slender dark fuscous apical and subapical rings, terminal joint

with slender ring near base. Antennæ longer than fore-wings, pale ochreous-brown, darker towards apex, basal joint yellow in front, crimson above. Thorax crimson, with a white central streak. Abdomen dark fuscous, at base ochreous, beneath white. Legs whitish; anterior tibiæ crimson, apex suffused with dark fuscous, middle tibiæ somewhat thickened, almost tufted at apex, crimson with yellow basal and median bands, all tarsi with dark fuscous rings at apex of joints. Fore-wings crimson, paler and partially suffused with yellow along costa, especially beyond middle, with a basal streak, six costal and four dorsal streaks, and a spot on fold white, partially suffused with yellow; basal streak very short, irregular, dark-margined, its extremity produced through centre of wing to middle as a dark fuscous line; first and second costal streaks irregular, very oblique, white, not margined; third elongate-triangular, very oblique, not margined; fourth irregular black margined; fifth short, less oblique, strongly black margined, the black margins continued to anal; costal space between fourth and fifth yellowish-white; sixth short, black margined, not oblique, black margins produced to hind-margin and diverging; first dorsal spot at base, very small; second small, opposite first costal, obtuse-triangular, white, black edged in front on inner-margin; third before middle, yellow, very broad on inner-margin, very much contracted on fold and proceeding as a very oblique white dark-margined streak to disc; fourth yellow, very broad on inner-margin, extending from middle to anal angle, obtuse-triangular, apex dark-margined; a round white spot on fold between second and third, not touching either; hind-margin suffused with dark fuscous except within the two pairs of dark streaks from costa; apical spot round, black; cilia crimson at apex, yellow on hind-margin, thence dark fuscous, with a crimson subapical hook. Hind-wings and cilia dark grey.

Stainton's description clearly includes both this insect and the succeeding species, which is very closely allied to it; they are however certainly distinct. His figure seems to be taken from a

specimen of this species, for which I have accordingly retained the name. The true *formosa* is best known by the narrower fore-wings, yellower markings, which also differ in detail, and especially by the round white spot on the fold, which in *Grac. ida*, forms part of a dorsal streak. A widely distributed species, but almost always taken singly, without any clue to its habits; occurs at Sydney, Parramatta, and Bulli, and also near Brisbane and Melbourne, from October to March without apparent interruption, usually in thick bush.

Grac. ida, *n. sp.*

♂ ♀. 5"-5½". Head white, very faintly tinged with yellowish, with a broad central stripe on crown and the sides crimson; face white, speckled with crimson. Maxillary palpi white, apex of second and terminal joints dark fuscous. Labial palpi white, base and apex crimson, second joint with subapical and apical rings, terminal joint with a ring near base dark fuscous. Antennæ longer than fore-wings, ochreous-grey, darker towards apex, basal joint crimson, in front white. Thorax whitish, irregularly suffused and spotted with crimson. Abdomen blackish, beneath snow-white. Legs whitish, anterior tibiæ crimson with two slender white rings, middle tibiæ somewhat thickened, almost tufted at apex, with two white bands, all tarsi with slender dark fuscous rings at apex of joints. Fore-wings crimson, disc usually suffused with fuscous-grey, with seven costal and normally five (sometimes partially confluent) dorsal streaks and an apical spot white, faintly tinged with creamy-yellowish; a minute white spot on costa at base; first, second, and third costal streaks irregular, very oblique, not margined, reaching middle of wing; fourth subquadrate, unmargined; fifth immediately adjacent to fourth, fifth and sixth short, subquadrate, each enclosed between dark fuscous margins which are extended very obliquely to beyond middle of wing, ending in loops; costal space between fifth and sixth white; seventh subquadrate, enclosed between dark margins

contracted and produced to middle of hind-margin; first dorsal spot small, close to base; second and third long, acute-triangular very oblique, second sometimes confluent with first on margin; fourth before anal angle, obtuse-triangular, not oblique; fifth on hind-margin above anal angle, elongated along margin, sometimes confluent with fourth; a small white spot above middle of wing between second and third costal streaks; a curved white streak immediately before apex, enclosing a round black apical spot; cilia yellowish round apex, with two crimson hooks, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Somewhat less brightly coloured than *formosa*, but even more elegant. At first sight the two species are very similar, and both are somewhat variable, but within constant limits; for the identification of this species I should lay stress upon the broader wings, the frequent (but not invariable) suffusion with fuscous-grey, the irregular crimson spotting of the thorax, the head white rather than yellow, and the detailed differences in marking, especially the presence of several additional small spots, the absorption of the spot on the fold by the second dorsal streak, and the termination of the dark costal streaks not on hind-margin but in loops before reaching it. The species is also widely distributed, and has the same habits as the last; taken at Sydney, Parramatta, Bulli, and Brisbane, from August to November, in January, and March.

Grac. mnesicala, *n. sp.*

♂. $3\frac{3}{4}$ ". Head and palpi snow-white, terminal joint of labial palpi with slender black basal, central, and apical rings. Antennæ as long as fore-wings, white, annulated with dark fuscous. Thorax white, posteriorly brownish-ochreous. Abdomen pale greyish-ochreous. Legs white, tarsal joints very slenderly black at apex, anterior and middle tibiæ ringed with black, not thickened. Fore-wings snow-white, inner margin within an irregular line from centre of base to anal angle brownish-ochreous, intersected

by two very oblique white lines before and beyond middle; eight dark fuscous oblique, transverse strigulae from costa between base and $\frac{3}{4}$, nearly reaching inner-marginal streak, the first four interrupted and broken into spots, the seventh connected on disc with a longitudinal strigula from centre of wing; between the eighth and apex are two other similar, less oblique strigulae from costa reaching across wing, the interior one connected with the eighth by three longitudinal streaks; a small cloudy subapical fuscous spot, and a black apical dot; cilia white round apex, with a greyish-ochreous spot at apex, and with two faint fuscous lines, thence whitish-grey. Hind-wings fuscous-grey, cilia whitish-grey.

Allied to the preceding and following species, but at once distinguished from all by the ochreous inner-marginal streak. Two specimens taken in dry scrub near Sydney and Parramatta, in September.

Grac. lyginella, *n. sp.*

♀. 3". Head and palpi snow-white, terminal joint of labial palpi with a black subapical ring. Antennae as long as forewings, white, annulated with black. Thorax white (?). Abdomen greyish-ochreous, anal segment black at base. Legs white, tarsal joints very broadly black at base, tibiae irregularly banded with black, not thickened. Fore-wings white, with blackish-fuscous markings, tending to become suffused towards apex; a central streak from base to middle of wing; an inwardly oblique costal strigula near base; two costal spots before and after $\frac{1}{4}$, the first larger; between the second and the basal streak is a short longitudinal streak; beyond these are three irregular oblique strigulae from costa becoming confluent on disc and extending confusedly to inner-margin; on inner-margin is a small spot near base, and two oblique strigulae before middle, uniting with basal streak; a cloudy costal spot before apex; an elongated black apical streak; cilia round apex white with two black lines, thence fuscous-grey. Hind-wings fuscous-grey, cilia rather paler.

Distinguished by its small size and cloudy markings, which also differ in detail. One specimen only, from dry bush at Parramatta in October.

Grac. aëllomacha, n. sp.

♂. $3\frac{1}{2}''$. Head and palpi snow-white, labial palpi with apex of second joint and a subapical ring of terminal joint black. Antennæ longer than fore-wings, white. Thorax snow-white, with a small black shoulder spot. Abdomen dark fuscous, beneath with white rings and white towards apex. Legs white, tarsi with three black rings, anterior tibiæ black, middle tibiæ hardly thickened, apical half black. Fore-wings white, with coarsely scaled fuscous-black markings; a cloudy, central, longitudinal streak from near base to disc above anal angle, connecting obscurely with seven oblique costal and five oblique dorsal streaks; costa blackish at base; first and second costal streaks thick, hardly oblique, meeting first and second dorsal streaks; third slender, very short, not reaching central streak; fourth strong, from middle of costa; fifth slender, short; sixth thick, black, very oblique, uniting with the small fifth dorsal on anal angle; fourth dorsal thick, before middle; seventh costal slender, produced nearly to hind-margin; apical spot black, large, round, cloudy; cilia white round apex, dark fuscous at anal angle, with two black lines and a short black apical hook, thence fuscous-grey. Hind-wings fuscous-grey, cilia paler.

Not particularly close to the preceding; it resembles rather the figure of Zellers's *urbanella*, from South America, which however he considers to be hardly a true *Gracilaria*. One specimen from forest growth at Wellington, New Zealand, in January.

Grac. thalassias, n. sp.

♂ ♀. $2\frac{3}{4}''$ - $3\frac{1}{2}''$. Head and maxillary palpi white. Labial palpi white, second joint loosely scaled beneath, with apex blackish, terminal joint with slender blackish median and subapical rings.

Antennæ not longer than fore-wings, white, annulated with dark fuscous. Thorax white, lateral margins ochreous. Abdomen pale greyish-ochreous, beneath white. Legs white, anterior and middle tibiæ hardly thickened, blackish with three white rings, all tarsi with blackish rings at apex of joints. Fore-wings varying from pale clear ochreous to greyish-ochreous, with a basal streak, five costal and three dorsal streaks white; basal streak rather short, rather slender, not margined, sometimes connected at its middle with costa; first costal streak at $\frac{1}{3}$, second at $\frac{1}{2}$, both long, slender, oblique, dark-margined; third rather less oblique, dark-margined, more or less perfectly uniting with third dorsal streak from anal angle; fourth costal from before apex to middle of hind-margin, continued into cilia, dark-margined; first dorsal slightly beyond first costal, rather long, very oblique, dark-margined above, produced along inner-margin as a white unmargined streak to base; second dorsal rather thick, irregular, its apex swollen, dark-margined, very oblique; a small white apical spot, continued above into cilia, enclosing the small linear-ovate black apical dot; cilia greyish-ochreous round apex, extremities white, beneath apex whitish. Hind-wings and cilia whitish-grey.

This species belongs to the group of *pavoniella*, Z., but is readily known by its pale ground colour, which gives it much the appearance of some species of *Lithocolletis*. Where its foodplant grows, the imago may be taken in great profusion, flying out in swarms when the bush is shaken; it occurs principally on coast sand-hills, at Sydney and Newcastle, New South Wales, from September to January, and in May.

Larva slightly tapering posteriorly, very pale whitish-green, yellowish-tinged on back; head very pale whitish-brown. It mines the leaves of *Leptospermum laevigatum* (*Myrtaceæ*), forming a blotch which occupies the whole of the small leaf, both surfaces being much inflated, in January (and no doubt at other times). Pupa outside the mine, in a firm white cocoon beneath a folded

corner of leaf. I have also found the larva on *Agonis flexuosa*, a closely allied plant, but a native of West Australia, and only found here under cultivation; it does not however frequent the other common species of *Leptospermum*.

Grac. eumetalla, *n. sp.*

♂ ♀. 3"-3½". Head, palpi, and thorax bright metallic bronzy-green, face bright silvery. Antennæ as long as fore-wings, blackish. Abdomen black above, silvery-white beneath. Legs metallic silvery, posterior tibiæ stiff-haired above, and, together with tarsi, suffused externally with fuscous. Fore-wings bright metallic coppery or bronzy green, with white violet-shining markings, consisting of four costal and four dorsal short slender wedgeshaped streaks, and a discal spot, all black-margined; first costal streak at $\frac{1}{3}$, second at $\frac{1}{2}$, both slightly oblique outwardly; third at $\frac{3}{4}$, short, not oblique; fourth uniting with fourth dorsal streak to make an inwardly curved fascia; first dorsal streak much before first costal, rather long, curved, very oblique; second short, straight, between first and second costal streaks; third opposite third costal, outwardly oblique, nearly uniting with fourth; a small irregular, sometimes double, discal spot between second and third pairs of streaks; apical spot round, black, obscure; cilia blackish-fuscous, with a black line round apex. Hind-wings and cilia blackish-grey.

A brilliant insect, distinguished amongst its allies by its bright metallic colouring. I beat several specimens from a phyllodineous *Acacia* (to which it is probably attached) near Brisbane in September; also once taken on a fence near Sydney, in October.

Grac. eupetala, *n. sp.*

♂ ♀. 3¼"-3½". Head and palpi bright metallic grey-silvery. Antennæ as long as fore-wings, blackish. Thorax deep metallic bronze. Abdomen blackish, beneath snow-white with black bands. Legs dark fuscous, tarsal joints with slender whitish

apical rings. Fore-wings pale golden-ochreous on disc, elsewhere especially on inner-margin, suffused with dark metallic bronze, with pearly-white obscurely dark-margined markings, consisting of four costal and four dorsal streaks or spots, and a small discal spot; first three costal streaks before and beyond middle and at $\frac{3}{4}$, slender, short, oblique, with violet reflections; fourth closely after third not oblique; first dorsal spot conspicuous, broadly wedgeshaped, oblique and curved outwards; second rather smaller, triangular, not oblique, between first and second costal; third still smaller, triangular, opposite third costal; fourth minute, indistinct, opposite fourth costal; discal spot small, circular, between second and third pairs of streaks; apical space suffused with blackish; cilia white round apex, with a black line, thence fuscous-grey. Hind-wings and cilia fuscous-grey.

Nearly allied to the preceding, but much less brilliant, and the first three dorsal spots are much broader and more conspicuous. Not common; in *Acacia* groves near Parramatta, and on fences in Sydney. I once bred the species, almost certainly from a branch of *Acacia decurrens*, (*Leguminosæ*), which was in my room; but the larva had not been noticed.

NOTE.—I have found a *Gracilaria* larva mining flat whitish blotches in the phyllodia of *Acacia longifolia*, which I have not yet succeeded in breeding; it is probably an allied species.

Grac. alysidota, n. sp.

♂ ♀ . 3"-4 $\frac{1}{2}$ ". Head white, with a dark fuscous stripe on sides. Palpi whitish, maxillary palpi very short. Antennæ not longer than fore-wings, dark fuscous, apical third white. Thorax dark fuscous, with a white spot in front. Abdomen dark fuscous, beneath white. Legs greyish-fuscous, apex of tarsal joints indistinctly whitish, posterior tibiæ stiff-haired near apex. Fore-wings dark fuscous, towards apex sometimes suffused with ochreous, with five costal and four dorsal streaks, and a streak along inner-margin white, blackish-margined; first costal streak

at $\frac{1}{4}$, rather long, very oblique, slightly produced along costa towards base; second at $\frac{1}{2}$, longer, very oblique; third before $\frac{3}{4}$, rather shorter, equally oblique; fourth short, not oblique, uniting with fourth dorsal to form a straight slender fascia; first dorsal immediately before middle, short, oblique, connected with a streak along inner-margin to base; second beyond middle, small, semiovate; third opposite third costal, rather short, oblique; fifth costal apical, intersecting the round black apical spot; cilia whitish round apex, with two black lines, thence dark fuscous-grey. Hind-wings and cilia fuscous-grey.

Not very near to any described species; easily recognised by the white streak on basal half of inner-margin on a dark fuscous ground. Three specimens, taken in mixed bush near Sydney, and on the Bulli Pass, in October and March.

Grac. ochrocephala, n. sp.

♂ ♀. 4". Head whitish-ochreous above, face whitish. Maxillary and labial palpi wholly white. Antennæ longer than forewings, dark fuscous, with faint paler annulations. Thorax whitish ochreous, lateral margins ochreous-fuscous. Abdomen dark fuscous, beneath narrowly white, anus white. Legs dark fuscous posterior tibiæ and apical rings of all tarsal joints ochreous-whitish, posterior tibiæ stiff-haired. Forewings deep brownish-ochreous, with a broad stripe along inner-margin from base, terminating abruptly at anal angle, whitish, entirely suffused with ochreous except along its upper edge, black margined above; a clear white, black margined, slender, oblique streak from costa at $\frac{3}{4}$, extending to hind-margin, its upper extremity produced along costa as a very slender white unmargined streak to $\frac{1}{4}$ from base; a second similar parallel streak immediately before apex; cilia dark fuscous, containing two snow-white posteriorly black-edged strigulæ above apex, and an ochreous-whitish mark beyond anal angle. Hind-wings blackish-fuscous, cilia slightly paler.

This and the three following species are very closely allied together; they belong to the group of *sculariella*, Z. and *gemoniella* Stt. They are best distinguished from one another by the different groundcolours, and the colouring of the inner-marginal streak and of the head; *ochrocephala* is also to be known by the slender white streak along costal edge. Two specimens, from mixed growth at Sydney and on the Bulli Pass, in October and November.

Grac. nerëis, n. sp.

♂. 4". Head and thorax glossy-white tinged with brassy-yellow, lateral margins of thorax blackish. Maxillary palpi white, exteriorly dark fuscous. Labial palpi white, second joint exteriorly dark fuscous, terminal joint with some scattered fuscous scales. Antennæ longer than fore-wings, dark fuscous. Abdomen blackish above, wholly snow-white beneath. Legs white, tarsal joints with broad dark fuscous rings at base, anterior tibiæ dark fuscous, middle tibiæ hardly thickened, dark fuscous with white median band, posterior tibiæ stiff-haired. Fore-wings dark fuscous, with a rather broad brassy yellowish-white stripe along inner-margin from base terminating abruptly at anal angle, very strongly black margined above; a white circular spot on hind-margin just above anal angle; a thick black oblique streak from costa at four-fifths, extending to the white hind-marginal spot; a similar streak just before apex, ending in apex; cilia dark fuscous-grey, with two white posteriorly black margined strigulae above apex, and a black apical hook. Hind-wings blackish-fuscous, cilia slightly paler.

Nearest to *didymella*; distinguished by the darker ground colour, brassy-metallic tints, and the obscuration of the white costal streaks with black scales. One specimen on a fence in Sydney, in November.

Grac. didymella, n. sp.

♂. $4\frac{1}{2}$ ". Head and palpi pure white, labial palpi with extreme apex of second joint blackish. Antennæ longer than fore-wings, dark fuscous, beneath whitish; basal joint black, longitudinally striated with white. Thorax white, lateral margins dark fuscous. Abdomen dark fuscous, beneath whitish, anal tuft white. Legs whitish, suffused above with dark fuscous, except posterior tibiæ and apex of tarsal joints; posterior tibiæ stiff-haired above. Fore-wings dark greyish-ochreous, with a broad white, above black margined, stripe along inner-margin from base, abruptly rounded off at anal angle; extreme inner-marginal edge faintly ochreous; immediately beyond end of dorsal stripe a white elongate spot along hind-margin; a white strongly black margined slender, oblique streak from costa at $\frac{3}{4}$, reaching hind-marginal spot; another similar parallel streak immediately before apex, terminating in the small round, black, apical spot; cilia fuscous-grey, with two white posteriorly black margined strigulæ above apex, inner one very marked. Hind-wings fuscous-grey, cilia paler.

Differs from both the preceding by the white head and almost wholly white dorsal streak; from *ochrocephala* also by the white hind-marginal spot, and from *nerëis* by the white costal streaks. One specimen in a garden near Sydney in September.

Grac. laciniella, n. sp.

♂ ♀. $3\frac{1}{4}$ "- $3\frac{3}{4}$ ". Head and palpi white, second joint of labial palpi dark fuscous at apex, apical scales somewhat produced beneath, terminal joint with a fuscous ring near base. Antennæ as long as fore-wings, white at base, becoming gradually dark fuscous. Thorax white, lateral margins dark greyish-ochreous. Abdomen ochreous-grey, beneath pure white. Legs white, anterior and middle tibiæ hardly thickened, dark fuscous with white rings near base and in middle, posterior tibiæ stiff-haired, all tarsi with apical bands of joints and two rings on basal joint

dark fuscous. Fore-wings ochreous-fuscous, with a clear white streak along fold from base to just above anal angle, not touching inner-margin, margined with black above and below at extremity only; a white elongate spot on hind-margin; an oblique slender white black margined streak from costa at four-fifths, meeting the white hind-marginal spot; a second similar streak just before apex; both these streaks are often quite obsolete; apical spot irregular, black; cilia fuscous-grey, with two white posteriorly black margined strigulae above apex. Hind-wings and cilia fuscous-grey.

Distinguished from its allies by its smaller size, and by the white streak being clearly removed from inner-margin. It also has the peculiar habit of holding its antennae porrected forwards, and somewhat divergent, when at rest. A common species, occurring among dry scrub near Sydney and Parramatta, at Bulli, and at Blackheath on the Blue Mountains (3,500 feet); also at Brisbane. It is generally beaten from *Eucalyptus*, and I have found a larva mining flat whitish blotches in the leaves of *Eucalyptus*, which I expected to produce it, but have not yet succeeded in rearing.

Grac. albomarginata, *Stt.*, Trans. Ent. Soc. Lond., Vol. I.,
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"4½". Head white, with a few grey scales. Maxillary palpi white, very minute. Labial palpi white, with a dark grey ring before apex of second joint, and base and apex of terminal joint greyish. Antennae white, with grey annulations. Anterior tibiae dark grey, tarsi white, with two broad dark grey blotches; middle tibiae dark grey with white blotches, tarsi white; posterior tibiae whitish, tarsi white spotted with dark grey; all the legs appear usually hairy. Fore-wings dark brownish-grey, with a narrow, white stripe all along inner-margin, and the costa narrowly white from middle to near apex; margins of these streaks not sharply defined, that on the inner-margin especially is very

jagged; a minute black apical spot, with a metallic-bluish tinge; hind-margin expressed in black scales; cilia grey, intersected by a row of blackish scales round the hind-margin, and with a tendency to a small projecting blackish hook."

The above is Stainton's description, taken from a single specimen with thorax injured, and no abdomen, from near Brisbane; it does not appear to correspond to any insect I have seen, but the species is probably allied to the group of *laciniella*.

CORISCUM, Z.

Head smooth; no ocelli; tongue long. Antennæ as long or longer than fore-wings, slender, filiform. Maxillary palpi rather long, filiform. Labial palpi moderately long, slender, ascending, second joint beneath with projecting tuft of hairs; terminal joint longer than second, pointed. Fore-wings elongate, very narrow, parallel-sided. Hind-wings very narrowly-lanceolate, much narrower than fore-wings, cilia thrice or four times as broad. Abdomen elongate, slender. Legs long. Fore-wings with 12 or 11 veins, 5 branches to costa, no secondary cell, 1 simple. Hind-wings with 8 veins; 5 and 6 stalked, cell open.

A small genus, comprising only some eight or nine species as yet, but found in every part of the globe; it only differs from *Gracilaria* by the distinct rather long tuft of hairs on the second joint of the palpi. In repose they usually have the same attitude as in *Gracilaria*; the larval habits are also similar.

Cor. ochridorsellum, n. sp.

♂ ♀. $4\frac{1}{2}$ "-5". Head pure ochreous, face white. Maxillary palpi whitish, basal joint fuscous. Labial palpi whitish, second joint externally dark fuscous, with a blackish tuft nearly as long as terminal joint, its anterior edge white; terminal joint with an indistinct fuscous ring near base. Antennæ much longer than fore-wings, dark fuscous with slender whitish annulations, basal joint whitish. Thorax ochreous-whitish, with a dark fuscous

spot on shoulder. Abdomen pale greyish-ochreous, with a row of oblique linear dark fuscous spots on sides. Legs slender, dark fuscous, all tarsi with whitish rings at apex of joints, posterior tibiæ stiff-haired. Fore-wings blackish with a few ochreous scales, with inner-margin rather broadly whitish-ochreous from base almost to apex, dilating and becoming deeper ochreous above anal angle; three small white costal spots; first beyond middle, very small; second and third near together before apex, slender, oblique, meeting the dorsal streak; extreme apex jet black; cilia whitish round apex, with two black lines, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Easily known by the broadly ochreous inner-margin. This species walks with the forepart raised and the legs moderately displayed, as usual in the genus; but in repose on tree-trunks, as it is generally found, the body is closely appressed to the bark, and the anterior and middle pairs of legs stretched out laterally and also closely appressed to the surface, a modification adopted for the sake of concealment. The imago is common on the trunk of its food-plant in gardens in Sydney, from November to February.

Larva attenuated posteriorly, deep green; head extremely small, black; it mines an irregular flat, rather small blotch, on upper side of leaves of *Phyllanthus Ferdinandii*, (*Euphorbiaceæ*), in January and February. Pupa inside the mine, in a slight cocoon; this is certainly the normal habit.

Cor. æolellum, *n. sp.*

♂. $4\frac{1}{4}$ ". Head white, on crown tinged with ochreous and mixed with grey. Maxillary palpi whitish. Labial palpi white, second joint externally dark fuscous, with a blackish tuft nearly as long as terminal joint; terminal joint with two black rings. Antennæ longer than fore-wings, dark fuscous with paler annulations, extreme apex white. Thorax ochreous-grey mixed with dark fuscous. Abdomen greyish-ochreous. Legs dark

fuscous, tarsi with white rings at apex of joints. Fore-wings whitish, irrorated with dark grey-fuscous scales, especially towards costa and apex, leaving an ill-defined whitish space along fold from base to middle of wing, and with obscure black markings; a short central streak from base; two large irregular discal spots before and after middle; some cloudy blackish spots beneath costa; a very oblique thick streak from $\frac{2}{3}$ of costa nearly to hind-margin, above which is a similar shorter streak, not reaching costa; a black curved transverse line across wing just before apex, followed by a white line; apical spot round, upper half white, lower black; cilia whitish round apex, with two black lines, thence fuscous-grey. Hind-wings and cilia fuscous-grey.

An obscurely marked species, of which the only specimen is not very perfect, but certainly distinct from the preceding. One specimen taken on Mount Keira, near Wollongong, in October.

EPICEPHALA, n. g.

Head roughly short-haired on crown, hairs longer and directed forwards between antennæ, face smooth; no ocelli; tongue moderate. Antennæ longer than fore-wings, slender, filiform, basal joint compressed. Maxillary palpi rather-long, filiform. Labial palpi moderate, somewhat drooping, cylindrical, second joint with appressed scales. Fore-wings elongate, narrow, tolerably evenly pointed. Hind-wings narrow-lanceolate, cilia as broad. Abdomen elongate, in ♂ tufted, in ♀ with exserted ovipositor. Legs moderate, slender. Fore-wings with 10 veins; 4 branches to costa, no secondary cell, 1 simple. Hind-wings with 7 veins; 4 and 5 stalked, cell open.

In general structure near *Ornix*, Z., though the head is not quite so rough; differs in the venation, and also in the peculiar posture assumed in repose; the imago rests with the head appressed to the surface, the hind-part raised considerably and seemingly to be supported on the posterior legs, the anterior and

middle pair extended laterally and appressed to the surface. The wings are relatively broader than in *Gracilaria*.

Epic. colymbetella, *n. sp.*

♂ ♀. $4\frac{1}{2}$ "-5". Head white, with a few black hairs above antennæ. All palpi white, externally mixed with fuscous. Antennæ white, annulated with dark fuscous. Thorax fuscous-grey, speckled with whitish. Abdomen greyish-ochreous. Legs whitish, anterior and middle tibiæ fuscous-grey, tarsal joints fuscous-grey at base. Fore-wings whitish, densely irrorated with dark fuscous-grey scales, the absence of which causes white markings, more or less strongly margined with dark fuscous-grey; three rather short oblique costal streaks, the first longest; a fourth immediately after third, a little before apex, not oblique, almost or quite meeting a similar dorsal streak beyond anal angle; three other longer and more oblique dorsal streaks, but these are almost always confused and confluent into an irregular streak along inner margin; a bright ochreous round apical spot, containing a smaller black spot; cilia round apex white, with two strong black lines, thence dark fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Common on garden fences in Sydney, from November to January.

BEDELLIDÆ.

BEDELLIA, *Stt.*

Head rough above, almost tufted, face smooth; tongue short. Antennæ as long as fore-wings, filiform; basal joint thickened. No maxillary palpi. Labial palpi very short, somewhat porrected, filiform. Fore-wings elongate, narrow, long-pointed. Hind-wings linear-lanceolate, $\frac{1}{3}$ of fore-wings, cilia six times as broad. Abdomen moderate. Legs slender, posterior tibiæ compressed, hairy. Fore-wings with 8 veins; 3 and 4 stalked, 4 branches to

costa, cell closed, 1 simple. Hind-wings without cell; median three-branched, 1 branch to costa.

There appears to be but one species known in this genus, occurring throughout Europe and in North America, as well as Australia. The imago rests with the fore-part somewhat raised, but the fore-legs retracted beneath the body. The larva is sixteen-legged, and mines flat blotches in leaves. The pupa is naked and angulated, suspended from a leaf.

Bed. somnulentella, Z.

♂ ♀. $3\frac{1}{2}$ "-4". Head and palpi whitish-ochreous mixed with fuscous. Antennæ dark fuscous. Thorax whitish-ochreous, in front brownish-grey. Abdomen fuscous-grey, anal tuft ochreous. Legs whitish-ochreous. Fore-wings pale dull-ochreous, suffused and irrorated with brownish-grey, except on a streak along inner-margin; costal cilia sharply ochreous-whitish, the rest grey, irrorated with darker at apex. Hind-wings and cilia grey.

The description is from Australian specimens, which do not appear to differ specifically from the English. I have not however observed the larva in this country as yet; elsewhere it mines the leaves of *Convolvulus* and *Ipomæa*. It hardly seems a very likely species to have been introduced artificially, but it does not now seem easy to decide; it is not confined to the near neighbourhood of civilisation, and there are many native species of *Ipomæa*. Taken commonly in particular localities at Sydney and Parramatta and amongst the dense forest growth on the descent of the Bulli Pass, where it is especially abundant.

ARCTOCOMA, n. g.

Head roughly haired above, face smooth; no ocelli; tongue short. Antennæ rather shorter than fore-wings, filiform, basal joint somewhat thickened. No maxillary palpi. Labial palpi very short, drooping. Fore-wings elongate-lanceolate, rather broad comparatively. Hind-wings lanceolate, $\frac{1}{2}$ of fore-wings,

cilia thrice as broad. Abdomen moderate, stout. Legs rather short, posterior tibiæ compressed, very hairy. Fore-wings with 6 veins; 1 and 2 simple; 3, 4, 5 to costa, forming branches of subcostal vein; no cell. Hind-wings without cell; median simple; submedian very obsoletely twice-branched.

Allied to the preceding genus, but distinguished by the much broader wings, the antennæ shorter than fore-wings, and the low type of neurulation. The imago in repose sits closely appressed to surface.

Arct. ursinella, n. sp.

♂ ♀. $3\frac{3}{4}$ "-4". Head, palpi, thorax, and abdomen deep ochreous brown. Antennæ dark fuscous. Legs brownish-grey. Fore-wings unicolorous rather deep ochreous-brown; cilia fuscous-grey. Hind-wings and cilia dark fuscous-grey.

Beaten commonly from *Acacia decurrens*, at Parramatta, and also at Bulli, in October.

LYONETIDÆ.

STEGOMMATA, *n. g.*

Head roughly tufted on crown, face smooth; no ocelli; tongue moderate. Antennæ as long or longer than fore-wings, slender, filiform, basal joint dilated into a moderate eyecap, fringed in front. Maxillary palpi obsolete. Labial palpi moderately short, straight, rather drooping, smoothly scaled. Fore-wing elongate, narrow, pointed, apex caudate. Hind-wings linear-lanceolate, cilia five times as broad. Abdomen elongate. Legs moderate, slender. Fore-wings with 8 veins, cell closed, 1 strongly furcate at base, 5, 6, 7 to costa. Hind-wings without cell; median twice-branched; submedian apparently simple.

This genus is nearly allied to *Lyonetia*, Hb., and the neurulation is essentially identical; it differs in the strongly-tufted, rough

head. The species have some superficial resemblance to *Gracilaria*, but rest closely appressed to the surface.

Steg. leptomitella, *n. sp.*

♂ ♀. $3\frac{1}{2}$ "-4". Head, palpi, and thorax white, crown with a few fuscous-grey hairs. Antennæ white, annulated with dark fuscous. Abdomen grey-whitish. Legs white; anterior tibiæ, apex of middle and posterior tibiæ and of all tarsal joints dark fuscous-grey. Fore-wings white with dark fuscous-grey markings; two obscure longitudinal parallel streaks above middle of wing from near base to beyond middle, sometimes obliterated; seven very oblique streaks from costa, variable in thickness and intensity meeting the longitudinal streaks when distinct; beneath the two longitudinal streaks are four longitudinal short black streaks on disc, nearly in a line, third longest, in middle of wing, fourth rather oblique upwardly; five oblique dorsal streaks, but these are generally partially obliterated or interrupted; an irregular black spot in cilia, preceded by two pairs of outwardly radiating fuscous streaks, and followed by two dark fuscous lines round apex; hind-marginal cilia grey-whitish. Hind-wings grey, cilia whitish-grey.

Tolerably common on some fences in Sydney, in December and January.

Steg. sulfuratella, *n. sp.*

♂ ♀. 4"-4 $\frac{3}{4}$ ". Head, palpi, antennæ, and thorax white, faintly tinged with pale sulphur. Abdomen and legs white. Fore-wings white, dorsal half delicately suffused with pale sulphur-yellow; a very faint pale ochreous, longitudinal line in centre of wing from near base to beyond middle; three costal and two dorsal very faint ochreous oblique streaks; costal streaks between $\frac{2}{3}$ and apex, first dorsal streak in middle, second at anal angle, dorsal margin faintly ochreous for a short distance before anal angle; a clear round black apical dot, preceded by two pairs of

fuscous-grey outwardly radiating streaks in cilia, and an additional streak in hind-marginal cilia, and emitting a fuscous-grey apical hook; cilia white. Hind-wings pale fuscous-grey, cilia white.

Not capable of being confused with the last species. Common on fences in Sydney, in January and from April to August.

PHYLLOCNISTIS, Z.

Head smooth; no ocelli; tongue short. Antennæ shorter than fore-wings, slender, filiform, with a rather small eyecap. No maxillary palpi. Labial palpi short, drooping, very slender, filiform. Fore-wings elongate, narrow, pointed, apex rather produced. Hind-wings very narrowly lanceolate, $\frac{1}{3}$ of fore-wings, cilia five times as broad. Fore-wings with 9 veins; 4 and 5 stalked; 4 branches to costa, cell closed, 1 simple. Hind-wings without cell; median twice-branched.

The genus contains only a few closely allied species, but is found also in Europe, North and South America, and India. The larvæ are apodal, mining blotches in leaves. The pupa is in a cocoon inside the mine.

Phyll. diaugella, *n. sp.*

♂ ♀. $1\frac{3}{4}''$ - $2\frac{3}{4}''$. Head, palpi, antennæ, thorax, abdomen, and legs shining silvery-white. Fore-wings pearly white, with two longitudinal fuscous streaks from base of costa to middle of disc, not united posteriorly; an outwardly oblique, rather curved fuscous streak from costa beyond middle, nearly meeting a straight perpendicular fuscous transverse fascia immediately beyond it, the lower extremity of which sometimes forms a spot on inner-margin; between the fascia and apex is a rather large oval golden-ochreous patch; apical spot very distinct, round, black, preceded by two divergent fuscous streaks in costal cilia, and two others less distinct and equally divergent in hind-marginal cilia, and emitting a short grey apical streak; cilia white. Hind-wings whitish, cilia white.

Easily known from the following species by the longitudinal lines, and the absence of the costal blotch. Some specimens are extremely small, apparently the later brood. Taken occasionally at Manly, near Sydney, where the larva is common; in December March, and May.

Larva apodal, somewhat tapering posteriorly, pale yellowish; mines a flat irregular blotch, apparently consisting of a spiral gallery, in leaves of *Euphorbia sparmanni*, (*Euphorbiaceæ*), in February (and doubtless at other times).

Phyll. iodocella, *n. sp.*

♂. $2\frac{1}{4}$ ". Head, palpi, thorax, abdomen, and legs shining silvery-white. Antennæ white, towards apex infuscated. Fore-wings yellowish-white, with a semi-ovate dark fuscous, oblique blotch on costa near base, reaching to middle of wing; three costal and one dorsal, slender, oblique dark fuscous streaks; first costal in middle, second very short, third longest, continued to hind-margin; the dorsal streak beyond middle, bordered posteriorly by a small greyish-fuscous spot; dorsal margin slenderly blackish about anal angle; apical spot round, black, with apparently three radiating fuscous streaks in cilia above it, and one below it; cilia white. Hind-wings and cilia white.

Conspicuous by the costal blotch near base. One specimen on a fence in Sydney in November.

OPOSTEGA, Z.

Head smooth behind, roughly short-haired on face and forehead; no ocelli; no tongue. Antennæ shorter than fore-wings, thick, filiform, with a large eyecap. Maxillary palpi distinct. Labial palpi short, drooping, terminal joint very short. Fore-wings elongate, narrow, pointed. Hind-wings very narrowly lanceolate, cilia long. Abdomen flattened. Legs moderate; posterior tibiæ and first joint of tarsi stiff-haired. Fore-wings

with four simple attenuated longitudinal veins. Hind-wings without cell; median three-branched.

Also a small genus, of which the larvæ are all practically unknown, occurring in Europe and North America.

Op. orestias, n. sp.

♀, 3". Head, palpi, antennæ, thorax, abdomen, and legs snow-white. Fore-wings snow-white, with a small, bright ochreous-yellow apical blotch; an oblique dark fuscous streak from costa at $\frac{2}{3}$, bent posteriorly, ending in apex; a small clear black apical dot in cilia; three rather indistinct radiating fuscous streaks above it in costal cilia, the middle one darkest; cilia white. Hind-wings very pale whitish-grey, cilia white.

Distinguished by the yellow apex, and single costal streak. One specimen near Brisbane in swampy bush, in September.

Op. stiriella, n. sp.

♂ ♀. $2\frac{1}{2}$ "-3". Head, palpi, thorax, abdomen, and legs snow-white. Antennæ ochreous with white rings, basal joint white. Fore-wings snow-white; costal edge slenderly blackish at base; a small wedge-shaped oblique dark fuscous spot on costa, and a similar rather smaller one before middle of inner-margin, neither extending across more than $\frac{1}{4}$ of breadth of wing; an oblique ochreous-fuscous streak from $\frac{3}{4}$ of costa, ending suffusedly in apex; a minute black apical spot, with an inwardly oblique fuscous streak above it in costal cilia, and sometimes a second less oblique and very obscure, and one below it in hind-marginal cilia; cilia white. Hind-wings and cilia white.

Nearly allied to the following species, but may be known by the white hind-wings, and the oblique spots never form a complete fascia. Tolerably common at Parramatta, and in parts of the dense forest-growth on the slope of the Bulli Pass, in September and October, and again in March.

Op. gephyræa, n. sp.

♂ ♀ . 3''-3 $\frac{3}{4}$ '' . Head, palpi, thorax, and legs snow-white, tarsi slightly infuscated. Antennæ ochreous-fuscous, very slenderly annulated with white, basal joint white. Abdomen fuscous-grey. Fore-wings snow-white, extreme edge very slenderly blackish; a rather broad oblique blackish-fuscous spot on middle of costa, and a strong oblique fascia-form blackish-fuscous spot from before middle of inner-margin, uniting to form an angulated fascia, rarely not quite meeting; a very oblique black streak from $\frac{3}{4}$ of costa to apex, anteriorly broadly edged with fuscous; a second similar one immediately following it, partly in costal cilia, rather less oblique; a small black apical spot; cilia whitish round apex, tips suffused with fuscous, sometimes with a faint perpendicular streak above apical spot, hind-marginal cilia fuscous-grey. Hind-wings and cilia fuscous-grey.

Readily distinguished from the preceding by the dark hind-wings and usually perfect fascia. Apparently rather scarce; taken on fences in Sydney in October.

ATALOPSYCHA, n. g.

Head smooth, with appressed scales; no ocelli; tongue very short. Antennæ shorter than fore-wings, filiform, with a small eyecap. No maxillary palpi. Labial palpi short, drooping, filiform. Fore-wings elongate, narrow, pointed. Hind-wings narrowly lanceolate, less than $\frac{1}{2}$ of fore-wings, cilia thrice as broad. Abdomen moderate. Legs slender, posterior tibiæ long-haired. Neuration (?).

The single species has an extraordinary superficial resemblance to *Bucculatrix*, and might easily be confused with some of the paler species, yet structurally it is very distinct, since the labial palpi are plainly visible, and the head is not rough. Generally it is more difficult to distinguished from *Phyllocnistis*, especially as I have not been able to examine the venation, although it certainly does not belong to the immediate neighbourhood of

that genus; the best points to depend on seem to be the proportionally broader hind-wings, the somewhat loose, not glossy, scaling of the head, and the apex of fore-wings not produced.

Atal. atyphella, *n. sp.*

♀. $3\frac{3}{4}$ ". Head, palpi, and thorax white. Antennæ fuscous with whitish annulations, basal joint white. Abdomen greyish-ochreous. Legs whitish-ochreous. Fore-wings white, with pale ochreous markings irrorated with black scales; a small ovate-linear spot beneath costa slightly before middle; a very oblique streak from middle of costa, posteriorly suffused into an attenuated cloud along costa nearly to apex; a very oblique streak from dorsal margin just beyond middle, almost interrupted on margin itself; apex faintly suffused with ochreous, with indications of a linear apical spot of black scales; cilia very pale whitish-ochreous with a row of black points round apex. Hind-wings pale grey, cilia whitish-grey.

One specimen on a fence near Sydney in October.

CROBYLOPHORA, *n. g.*

Head roughly tufted on crown, face smooth; no ocelli; tongue very short. Antennæ shorter than fore-wings, filiform, with moderate eyecap. No maxillary palpi. Labial palpi short, drooping, filiform. Fore-wings elongate, narrow, pointed, apex hardly produced. Hind-wings very narrowly lanceolate, $\frac{1}{3}$ of fore-wings, cilia four or five times as broad. Abdomen moderate. Legs slender, posterior tibiæ stiff-haired. Fore-wings with seven veins; cell closed, 1 simple, 5 and 6 to costa. Hind-wings without cell; median obsoletely two-branched.

This genus is intermediate between *Stegommata* and *Bucculatrix*, resembling both in the roughly tufted head, and also having considerable affinity with them in other respects; it differs from the former by the short antennæ, and from the latter by the presence of labial palpi. The species described are very elegant

with a peculiarly thickened metallic spot at the anal angle of the fore-wings; they are slow in flight, and generally appear sluggish.

Crob. daricella, n. sp.

♂. $3\frac{1}{4}$ ". Head, palpi, antennæ, thorax, abdomen and legs snow-white; all tarsi with three blackish rings. Fore-wings snow-white, with two slender short oblique black costal streaks, first in middle, second immediately beyond it, closely strewn about which are a few irregular blackish and ochreous scales; a rather large circular thickened silvery metallic spot on anal angle, partially black-edged; cilia white, with a faint fuscous spot in costal cilia, from which proceeds a clear black line round apex, terminating abruptly just beyond it. Hind-wings and cilia white.

Differs from the following species by the larger size, and the absence of the basal and dorsal streaks. Two specimens taken in the thick subtropical scrubs at Rosewood, Queensland, in September.

Crob. chrysiidiella, n. sp.

♂ ♀. $2\frac{1}{2}$ "- $2\frac{3}{4}$ ". Head, palpi, antennæ, and legs snow-white. Thorax snow-white, with a yellowish spot on shoulder. Abdomen white, beneath with a yellowish band. Fore-wings white, with a yellowish, longitudinal, central streak from base to beyond middle, and with three oblique, yellowish, costal streaks and one dorsal; first costal streak long, very oblique, from $\frac{1}{4}$ of costa to apex of central streak, anteriorly margined with blackish scales; second rather beyond middle, third at $\frac{3}{4}$, shorter and less oblique, posteriorly margined by slender blackish lines, which are sometimes alone distinct; dorsal streak in middle, anteriorly margined by a slender, blackish line, sometimes alone visible, meeting apex of central streak; a faint yellowish spot at anal angle, containing a circular, thickened, silvery-golden metallic spot; cilia white, with a slender bent blackish line round apex terminating abruptly just beyond it. Hind-wings and cilia white.

Allied to the preceding, but with additional yellowish markings from base, and on costa and hind-margin. Common at Sydney and Newcastle from January to April, and in July and August, in dry scrub amongst different species of *Banksia* (*Proteaceæ*), on which the larva must feed. I have found rather commonly a larva mining blotches in upper surface of leaves of *Banksia serrata*, which I conjectured to belong to this species, but they proved difficult to rear, all drying up.

BUCCULATRIX, Z.

Head roughly tufted on crown, face smooth; no ocelli; tongue very short. Antennæ shorter than fore-wings, filiform, slender, with rather small eyecap. No maxillary palpi. No labial palpi. Fore-wings elongate, narrow, long-pointed, apex somewhat produced. Hind-wings narrowly lanceolate, $\frac{1}{3}$ to $\frac{1}{2}$ of fore-wings, cilia $2\frac{1}{2}$ to 4 times as broad. Legs slender, posterior tibiæ long-haired. Fore-wings with from 8 to 10 veins; 4 or 5 veins to costa, cell closed, 1 simple. Hind-wings without cell; median three-branched.

Probably a genus of moderate extent, at present represented by about forty rather closely allied species from Europe, and North and South America. The Australian species are very similar to the typical forms, and to one another. The genus may be immediately separated from all others by the roughly tufted head and the absence of palpi. The larvæ are peculiar amongst their allies; sixteen-legged, rough-skinned, mining when very young, but afterwards feeding externally and unprotected on the under side of leaves. Pupa in a silken cocoon, generally characteristically ribbed with raised longitudinal lines.

Bucc. eucalypti, n. sp.

♀. $2\frac{3}{4}$ ". Head with dark fuscous hairs on crown, behind whitish, face white. Antennæ white with dark fuscous annulations. Thorax whitish-ochreous. Abdomen whitish-grey. Legs whitish-

ochreous, tarsi with black rings at base of joints. Fore-wings brownish-ochreous mixed with paler, with suffused darker ochreous brown markings; an obsolete cloudy spot on costa beyond middle; a rather larger cloudy spot, suffused with blackish scales, on middle of inner-margin; apical spot minute, linear, black; cilia brownish-ochreous round apex, with scattered blackish points, whitish-grey on hind-margin. Hind-wings fuscous-grey, cilia pale grey.

Smaller than the two following species, and distinguished generally by the obsoleteness and suffusion of the markings on the brownish-ochreous fore-wings. One specimen bred in March from a single larva found at Sydney in February.

Larva of the typical form, pale dull green, head pale brownish; feeds on the under side of the leaves of *Eucalyptus* sp., (probably *tereticornis*), (*Myrtaceæ*), gnawing the surface of the leaf. Pupa in a firm, white, longitudinally five-ribbed cocoon.

Bucc. lassella, n. sp.

♂ ♀. $3\frac{1}{2}$ ". Head brownish-ochreous, with a pale stripe on each side of crown, and mixed with fuscous hairs; face whitish-ochreous. Antennæ whitish, with strong black annulations. Thorax brownish-ochreous irrorated with paler. Abdomen and legs pale brownish-ochreous, tarsi with distinct black rings at base of joints. Fore-wings whitish-ochreous, finely irrorated with dark fuscous scales, and with brownish-ochreous ill-defined markings; a central streak from base nearly to middle; two short broad oblique streaks from costa, first in middle, second at $\frac{3}{4}$, produced to apical spot; a fuscous oblique spot on inner-margin beyond middle, and extreme edge of inner-margin more or less distinctly brownish-ochreous; apical spot irregular, black; cilia ochreous-whitish round apex, with irregular rows of black points, pale grey on hind-margin. Hind-wings fuscous-grey, cilia rather paler.

Differs from the preceding by the duller colouring, and the much more distinct and more numerous markings. Four specimens taken on fences near Sydney, in December and January.

Bucc. asphyctella, n. sp.

♀. $3\frac{3}{4}$ ". Head white, centre of crown with a few fuscous hairs. Antennæ white at base, elsewhere suffused with dark fuscous. Thorax ochreous-whitish, with pale ochreous shoulder-spot. Abdomen ochreous-fuscous, sprinkled with white scales. Legs pale ochreous, tarsi with broad, cloudy, blackish rings at base of joints. Fore-wings dull whitish, with greyish-ochreous markings irrorated with dark fuscous scales; a central streak from base to middle; two oblique costal streaks, first in middle, produced along costa towards base as a very slender streak, second at $\frac{3}{4}$, ending in apical spot; a narrow irregular streak along inner-margin from base to apex; an oblique streak from inner margin beyond middle, its apex nearly confluent with second costal streak; an irregular elongated black apical spot; cilia whitish with scattered black points, on hind-margin whitish-grey. Hind-wings grey, cilia whitish-grey.

Much paler and more distinctly marked than *lassella*, and distinguished besides by the absence of the black and white annulations of the antennæ. One specimen in dry scrub near Parramatta in October.

The above descriptions include all the species of these families with which I am acquainted as occurring in this region, by whomsoever described. Walker has indeed described three species of *Micros* under *Gracilaria* as from Australia; one of these I have identified (*G. terminella*, Brit. Mus. Cat., p. 855), and it is not a *Gracilaria* at all, but one of the *Elachistidæ*, referable to a genus of which I have several other Australian species; it is highly improbable that the other two are correctly referred, but I cannot recognise them. He has also two species under *Gracilaria* from New Zealand; I have identified one (*G. arenosella*,

Brit. Mus. Cat., p. 857), and it is a *Batrachedra* (*Elachistidæ*). Walker's references of the smaller Micros are entirely haphazard and consequently not in reality worth even a passing notice.

NOTES AND EXHIBITS.

Note on a Block of Shale from the Hawkesbury Sandstone, by W. J. Stephens, M.A.—I desire to bring before the notice of our geological members, a specimen of shale from a boulder embedded in the Hawkesbury Sandstone at Broughton's Pass, where the tunnel between the Cataract and Nepean Rivers, in connection with the Sydney water supply, is now in progress. The point to which I wish to draw attention at present is that the block has before its deposition among the sands, which have ultimately hardened into rock, been subjected to severe strain and pressure in various directions, producing within its structure those smooth striated surfaces, which are known to miners as "Slickensides." The unconformity of these slides shows that they were not produced by any uniform or contemporaneous pressures or movements, and appear to me to corroborate in a very unexpected way the conclusions at which Mr. Wilkinson has arrived as to the existence of a glacial period during the formation of the Hawkesbury Rocks, *i. e.*, posterior to the formation of our upper coal, and probably equivalent to the Permian formations of better surveyed countries. For the irregular and sudden strains which are produced by massive Ice, when drifted by wind or current, forced along the land by pressure, or when slipping and tumbling in huge blocks in consequence of the alteration of their centres of gravity during the process of melting, are precisely such forces as must have produced the phenomena under our notice. Some confirmation may also be found in the absence from the shale thus affected of any of those fossil ferns which appear so abundantly in similar portions of the formation; and in the occurrence of thin laminæ of fine clay, sometimes with a smooth, mammillated surface,